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of walking in Virginia and the Carolinas. To obtain the relative abundance of species in the area involved³⁸ he counted the number of times each species was mentioned in the notes, and multiplied the figures for *Pinus Taeda* and *P. palustris* by 5, and for the other conifers by 3 before calculating the percentages. The figures for smaller trees were divided by 2 or by 10, for shrubs by 100, and for herbs by 500. The results were tabulated and are rather interesting. Some estimates of annual increment of the whole vegetation, of the amount of mineral matter taken each year from the soil, and of the amount of water transpired are based upon these analyses.—GEO. D. FULLER.

Forest sanitation.—In a recent bulletin MEINECKE³⁹ emphasizes the importance and also the difficulties of giving phytopathology a proper place in forest regulation. He elaborates methods of investigation and application, exemplifying by an actual study of *Abies concolor*. Forest sanitation is the keynote of the remedial measures proposed, a system of forest regulation which will give proper attention to the removal or destruction of diseased individuals from the community.

It is also interesting to note that WEIR,⁴⁰ after discussing the character and nature of the injuries due to various mistletoes, outlines methods of forest sanitation consisting of directing cutting so as to effect the removal of diseased communities and individuals. Such methods of forest sanitation he believes will become increasingly practicable with the increasing demand for cutting privileges in the National Forest Reserves.—GEO. D. FULLER.

Michigan sand dunes.—In a recent bulletin SANFORD⁴¹ estimates that sand dunes stretch for over 400 miles along shore lines of the state of Michigan and cover not less than 550 square miles of its territory. In the southern peninsula, with the removal of the forests, many of the dunes are becoming active again and now constitute a menace to valuable fruit growing lands. The importance of maintaining a forest cover is pointed out, and the various recognized methods of dune reclamation are described. The failure of certain efforts to control dune movement by planting is shown to be due to a discontinuance of work before the final cover of permanent forest growth becomes established. Such plantings made by the government at Manistee in 1902 resulted in a temporary cover, which a small amount of subsequent planting

³⁸ HARPER, R. M., A quantitative, volumetric, and dynamic study of the vegetation of the *Pinus Taeda* belt of Virginia and the Carolinas. Bull. Torr. Bot. Club 44:39-57. 1917.

³⁹ MEINECKE, E. P., Forest pathology in forest regulation. U.S. Dept. Agric. Bull. 275. pp. 63. 1916.

⁴⁰ WEIR, J. R., Some suggestions on the control of mistletoe in the national forests of the northwest. Forest Quart. 14:567-577. 1916.

⁴¹ SANFORD, F. H., Michigan shifting sands: their control and better utilization. Mich. Agric. Coll. Exp. Sta. Bull. 79. pp. 31. figs. 22. 1916.

would have converted into a permanent forest. A neglect of this attention resulted in the complete failure of the project.—GEO. D. FULLER.

Nitrogen relations of semi-arid soils.—MCBETH⁴² finds that semi-arid soils fail to nitrify dried blood when it is added in 1 per cent quantities. Under the conditions ammonia accumulates in the soil and 50 per cent of the nitrogen may be lost to the air (probably as ammonia) within 6 weeks. When added at ordinary fertilizer rates nitrification is complete. With green manures, especially legumes, nitrification is rapid. Fifty per cent of the nitrogen of the green manure is transformed to nitrates in 30 days. Furrow irrigation leads to the accumulation of the larger part of the nitrate in the surface 6 inches of the soil, and this often results in niter spots. Overhead or basin irrigation gives far better results. Mottled orange leaves show higher water content than checks, and extreme mottling is often, yet not invariably, associated with high nitrate content.—WM. CROCKER.

Effect of dust on photosynthesis.—The effect of surface films and dusts on physiological processes in plants has aroused considerable interest in recent years. California citrus vegetation in the neighborhood of cement works becomes covered with cement dust. Since the dry season lasts several months, the dust remains on the leaves for long periods. YOUNG⁴³ took advantage of this fact to determine the effect of dusts on carbohydrate synthesis. He found that the cement dust in some cases shuts out as much as 80 per cent of the light from the upper surface of the leaf, but this high exclusion of light did not interfere with carbohydrate synthesis. This work bears out in a practical and interesting way that of BROWN and ESCOMBE in showing the small amount of light that is really necessary for carbohydrate synthesis.—CHAS. O. APPLEMAN.

Nitrogen fixation.—The question of nitrogen fixation by filamentous fungi has been investigated by DUGGAR and DAVIS⁴⁴ with reference to *Aspergillus niger*, *Macrosporium commune*, *Penicillium digitatum*, *P. expansum*, *Glomerella Gossypii*, and *Phoma Betae*. Of these, *Phoma Betae* was the only form which was definitely shown to be capable of fixing free nitrogen. The quantities fixed by this fungus varied from 3.022 to 7.752 mg. per culture of 50 cc. of solution when sugar beet or mangel decoction with added sugar were used as culture media. The authors give a critical review of all the available literature on the subject, and in their own work exercised every precaution to avoid the errors and faulty methods which have led to the numerous conflicting results in the investigations of this problem.—H. HASSELBRING.

⁴² MCBETH, I. G., Relation of the transformation and distribution of soil nitrogen to the nutrition of citrus plants. Jour. Agric. Research 9:183-252. figs. 19. 1917.

⁴³ YOUNG, H. D., Studies on the relation of cement dust to citrus vegetation. I. The effect on photosynthesis. Biochem. Bull. 5:95-100. 1916.

⁴⁴ DUGGAR, B. M., and DAVIS, A. R., Studies in the physiology of the fungi. I. Nitrogen fixation. Ann. Mo. Bot. Gard. 3:413-437. 1916.